

PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

Conf. No.: 9617

Akira NAKAMURA

Group Art Unit: 2651

Serial No.: 09/903,868

Examiner: Andrew L. Sniezek

Filed: July 13, 2001

Atty. Docket No.: 103213-00032

For: MOTOR DRIVING DEVICE AND DISK DEVICE

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INFORMATION DISCLOSURE STATEMENT

Director of the U.S. PTO
P.O. Box 1450
Alexandria, VA 22313-1450

Technology Center 2600

Date: December 30, 2003


Sir:

Pursuant to 37 CFR §1.56, the attention of the Patent and Trademark Office is hereby directed to the information item(s) listed on the attached PTO-1449. Unless otherwise indicated herein, one copy of each item(s) is attached. It is respectfully requested that the information be expressly considered during the prosecution of this application, and that the item(s) be made of record therein and appear among the "References Cited" on any patent to issue therefrom.

- ☐ 1. This Information Disclosure Statement is being filed (a) within three months of the U.S. filing date, OR (b) before the mailing date of a first Office Action on the merits in the present application, OR (c) accompanies a Request for Continued Examination. No certification or fee is required.
- ☒ 2. This Information Disclosure Statement is being filed more than three months after the U.S. filing date AND after the mailing date of the first Office Action on the merits, but before the mailing date of a Final Rejection or Notice of Allowance.
- ☐ a. I hereby certify that each item of information contained in this Information Disclosure Statement was first cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this Information Disclosure Statement. 37 CFR §1.97(e)(1).
- ☐ b. I hereby certify that no item of information in this Information Disclosure Statement was cited in a communication from a foreign patent office in a counterpart foreign application or, to my knowledge after making reasonable inquiry, was known to any individual designated in 37 CFR §1.56(c) more than three months prior to the filing of this Information Disclosure Statement. 37 CFR §1.97(e)(2).

- ☒ c. A check in the amount of \$180.00 in payment of the fee under 37 CFR §1.17(p). Please charge any fee deficiency or credit any overpayment to Deposit Account No. 01-2300 as needed to ensure consideration of the disclosed information.
- ☐ 3. This Information Disclosure Statement is being filed more than three months after the U.S. filing date and after the mailing date of a Final Rejection or Notice of Allowance, but before payment of the Issue Fee. Applicant(s) hereby petition(s) that the Information Disclosure Statement be considered. Attached is our check in the amount of \$180.00 in payment of the petition fee under 37 CFR §1.17(i)(1). Please charge any fee deficiency or credit any overpayment to Deposit Account No. 01-2300 as needed to ensure consideration of the disclosed information.
- ☐ a. I hereby certify that each item of information contained in this Information Disclosure Statement was first cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this Information Disclosure Statement. 37 CFR §1.97(e)(1).
- ☐ b. I hereby certify that no item of information in this Information Disclosure Statement was cited in a communication from a foreign patent office in a counterpart foreign application or, to my knowledge after making reasonable inquiry, was known to any individual designated in 37 CFR §1.56(c) more than three months prior to the filing of this Information Disclosure Statement. 37 CFR §1.97(e)(2).
- ☒ 4. A concise explanation of the relevance of the non-English language reference(s) appears in the Appendix attached hereto.

Respectfully submitted,



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MATERIAL FOR INFORMATION DISCLOSURE STATEMENT

(Our Ref.: Y-234)

List of Prior Art References

1. Japanese Patent Application Laid-Open No. H5-56690,
laid-open on March 5, 1993
2. Japanese Utility Model Application Laid-Open No. S63-17598,
laid-open on February 5, 1988
3. Japanese Patent Application Laid-Open No. H11-306501,
laid-open on November 5, 1999
4. Japanese Patent Application Laid-Open No. 2000-29544,
laid-open on January 28, 2000
5. Japanese Patent Application Laid-Open No. 2000-3558,
laid-open on January 7, 2000

Comments

Reference 1

This reference discloses a method for setting a motor current. According to this method, a detected voltage obtained by detecting a motor drive current is compared with a reference voltage by a comparator, and the reference voltage is varied according to the output of the comparator in such a way as to keep the motor drive current constant. However, this technique simply addresses how to form a motor drive current, i.e., how to produce a current waveform that is large at start-up and that thereafter becomes small by varying a reference voltage. Thus, this technique does not address limiting a motor drive current below a limit value as achieved by the present invention.

Reference 2

This reference discloses a stepping motor driving device wherein, to reduce noise during seek motion, a limit is imposed on a motor drive current during seek motion and the limit is lifted at latest at the end of seek operation. By contrast, according to the present invention, with a view to making a single motor driver circuit ready for both a bus-powered and a self-powered motor, a limit is imposed on a motor drive current not only during seek motion but also at other times. Thus, the two inventions are clearly different from each other.

Reference 3

This reference discloses a disk device provided with a USB. However, as will be clear from the fact that this technique requires a voltage regulator, this technique is simply equivalent to the example described as prior art in the present application.

Reference 4

This reference discloses a power control device wherein, when the normal power consumption is lower than the current limit of the USB, the battery provided inside the device is charged and, when the power consumption of the power block is transiently higher than the current limit, power is fed from the battery to the power block. However, this technique does not involve providing a current limiting function within a motor driver, and is thus different from the present invention.

Reference 5

This reference discloses a data storage device that employs a stepping motor as a head transporting means. However, this technique does not involve limiting a motor drive current below a limit value as practiced in the present invention. Thus, this technique is simply equivalent to the example described as prior art in the present application.